

AMENDMENTS TO THE CLAIMS

In the Claims

The following is a marked-up version of the claims with the language that is underlined ("____") being added and the language that contains strikethrough ("—") or enclosed by brackets being deleted:

1. (Currently amended) A composition, comprising:
a metal nitrate selected from d-block metal nitrates and f-block metal nitrates, wherein the metal nitrate is selected from iron (III) nitrate, cobalt (II) nitrate, nickel (II) nitrate, cerium (III) nitrate and cerium (IV) nitrate; and
a metal salt having weakly bound counter anions, wherein the metal of the metal salt having weakly bound counter anions is selected from a d-block metal and an f-block metal.
2. (Canceled)
3. (Original) The composition of claim 1, wherein the metal salt having weakly bound counter anions is selected from copper (II) perchlorate, copper (II) trifluoromethanesulfonate, and copper (II) tetrafluoroborate.
4. (Currently amended) The composition of claim 1, wherein the metal nitrate is selected from iron (III) nitrate, cobalt (II) nitrate, nickel (II) nitrate, ~~copper (II)~~ nitrate, cerium (III) nitrate and cerium (IV) nitrate, and wherein the metal salt having weakly bound counter anions is selected from copper (II) perchlorate, copper (II) trifluoromethanesulfonate, and copper (II) tetrafluoroborate
5. (Canceled)
6. (Original) The composition of claim 1, further comprising a polyoxometalate.

7. (Original) The composition of claim 6, wherein the polyoxometalate has the formula $A[V_k Mo_m W_n Nb_o Ta_p M_c X_o O_d]^{r-}$, wherein A includes at least one counterion selected from alkali metal cations, alkaline earth metal cations, ammonium cations, quaternary ammonium cations, d-block cations, f-block cations, and combinations thereof, wherein M includes at least one element selected from an f-block element and a d-block element having at least one d-electron, except for vanadium, molybdenum, tungsten, niobium, or tantalum, wherein X includes at least one element selected from a p-block element, a d-block element, and an f-block element, except for oxygen, wherein k can range from 0 to 30, wherein m can range from 0 to 160, wherein n can range from 0 to 160, wherein o can range from 0 to 30, where p can range from 0 to 10, wherein q can range from 0 to 30, wherein r can range from 0 to 30, wherein s is a number so that y is greater than zero, wherein the sum of k, m, n, o, and p is greater than or equal to four; and wherein the sum of k, m, and q is greater than zero.

8. (Original) The composition of claim 6, wherein the polyoxometalate has the formula $[X^g V_b]^+ M_c^{h+} Z_{12-b-c}^{i+} O_d^{u-} [A]$, wherein X is at least one p-, d-, or f-block element; g is greater than or equal to 2; M is at least one f-block element or d-block element having at least one d-electron, wherein M is not vanadium; h is from 1 to 7; i is from 5 to 6; j is from 4 to 5; x is 39 or 40; Z is tungsten, molybdenum, niobium, or a combination thereof; b is from 0 to 6; c is from 0 to 6; u is from 3 to 9; and A is a counterion.

9. (Previously presented) The composition of claim 6 8, wherein the polyoxometalate has the formula $[X^g V_b]^+ Z_{12-b}^{i+} O_{40}^{u-} [A]$, wherein X is at least one of phosphorus, silicon, aluminum, boron, zinc, cobalt, or iron; b is from 1 to 6.

10. (Previously presented) The composition of claim 8, wherein the polyoxometalate has the formula $[X^g M_c^{h+} Z_{12-c}^{i+} O_{40}^{u-} [A]$, wherein X is at least one of phosphorus, silicon, aluminum, boron, zinc, cobalt, or iron; c is from 1 to 6, and a u is from 3 to 9.

11. (Currently amended) The composition of claim 6, wherein the polyoxometalate has the formula $[X_2^r V_u^{5+} M_v^{4+} Z_{18-u-v}^{y+} O_z]^w [A]$, wherein X is at least one p-, d-, or f-block element; r is greater than or equal to 1; M is at least one f-block element or d-block element having at least one d-electron, wherein M is not vanadium; t is from 1 to 7; s is from 4 to 5; Z is tungsten, molybdenum, niobium, or a combination thereof; a \underline{u} is from 0 to 9; v is from 0 to 9; y is from 5 to 6; z is 61 or 62; w is greater than or equal to 4; and A is a counterion.
12. (Previously presented) The composition of claim 11, wherein the polyoxometalate has the formula $[X_2^r V_u^{5+} Z_{18-u}^{y+} O_{62}]^w [A]$, wherein X is at least one of phosphorus, sulfur, silicon, aluminum, boron, zinc, cobalt, or iron; a \underline{u} is from 1 to 9; and w is greater than or equal to 4.
13. (Previously presented) The composition of claim 11, wherein the polyoxometalate has the formula $[X_2^r M_v^{4+} Z_{18-v}^{y+} O_{62}]^w [A]$, wherein X is at least one of phosphorus, sulfur, silicon, aluminum, boron, zinc, cobalt, or iron; v is from 1 to 9; and w is greater than or equal to 4.
14. (Original) The composition of claim 6, wherein the polyoxometalate has the formula $[YV_p Z_{12-p} O_{40}] [A]$, wherein Y is phosphorus, silicon, or aluminum; Z is tungsten or molybdenum; p is from 1 to 6, and A is a counterion.
15. (Original) The composition of claim 6, wherein the metal nitrate is selected from iron (III) nitrate, cobalt (II) nitrate, nickel (II) nitrate, copper (II) nitrate, cerium (III) nitrate and cerium (IV) nitrate.
16. (Canceled)
17. (Currently amended) The composition of claim 6, wherein the metal nitrate is selected from iron (III) nitrate, cobalt (II) nitrate, nickel (II) nitrate, ~~copper (II)~~ nitrate, cerium (III) nitrate and cerium (IV) nitrate, and wherein the metal salt having weakly bound counter anions is selected from copper (II) perchlorate, copper (II) trifluoromethanesulfonate, and copper (II) tetrafluoroborate.

18. (Previously presented) The composition of claim 6, wherein the polyoxometalate is selected from $\text{TBA}_6\text{Fe}_3\text{PW}_9\text{O}_{37}$, wherein TBA is tetra-*n*-butylammonium; $\text{TBA}_6\text{V}_{10}\text{O}_{28}$, $\text{TBA}_6\text{PV}_2\text{Mo}_{10}\text{O}_{40}$; $\text{TBA}_9\text{Fe}_3(\text{A-PW}_9\text{O}_{34})_2$; and $\text{TBA}_{12}\text{Fe}(\text{OH})_2\text{Fe}_2(\text{P}_2\text{W}_{15}\text{O}_{56})_2$.
19. (Canceled)
20. (Original) The composition of claim 1, wherein the composition is included in a material.
21. (Original) The composition of claim 6, wherein the composition is included in a material.
22. (Original) The composition of claim 20, wherein the material being selected from a fabric, a topical carrier, powder, and a coating.
23. (Original) The composition of claim 21, wherein the material being selected from a fabric, a topical carrier, powder, and a coating.
24. (Original) A method of removing a contaminant, comprising:
contacting the composition of claim 1 with the contaminant.
25. (Original) The method of claim 24, wherein the composition is included in a material.
26. (Original) The method of claim 25, wherein the material being selected from a fabric, a topical carrier, powder, and a coating.
27. (Original) A method of removing a contaminant, comprising:
contacting the composition of claim 6 with the contaminant.
28. (Original) The method of claim 27, wherein the composition is included in a material

29. (Original) The method of claim 28, wherein the material selected from a fabric, a topical carrier, powder, and a coating.

30-58 (Canceled)

59. (New) A composition, comprising:

a metal nitrate selected from d-block metal nitrates and f-block metal nitrates;

a metal salt having weakly bound counter anions, wherein the metal of the metal salt having weakly bound counter anions is selected from a d-block metal and an f-block metal; and

a polyoxometalate.

60. (New) The composition of claim 59, wherein the metal nitrate is selected from iron (III) nitrate, cobalt (II) nitrate, nickel (II) nitrate, copper (II) nitrate, cerium (III) nitrate and cerium (IV) nitrate.
61. (New) The composition of claim 59, wherein the metal salt having weakly bound counter anions is selected from copper (II) perchlorate, copper (II) trifluoromethanesulfonate, and copper (II) tetrafluoroborate.
62. (New) The composition of claim 59, wherein the metal nitrate is selected from iron (III) nitrate, cobalt (II) nitrate, nickel (II) nitrate, copper (II) nitrate, cerium (III) nitrate and cerium (IV) nitrate, and wherein the metal salt having weakly bound counter anions is selected from copper (II) perchlorate, copper (II) trifluoromethanesulfonate, and copper (II) tetrafluoroborate
63. (New) The composition of claim 59, wherein the metal nitrate is copper nitrate and the metal salt having weakly bound counter anions is copper trifluoromethanesulfonate.

64. (New) The composition of claim 59, wherein the polyoxometalate has the formula $A[V_kMo_mW_nNb_oTa_pM_qX_o]^{y-}$, wherein A includes at least one counterion selected from alkali metal cations, alkaline earth metal cations, ammonium cations, quaternary ammonium cations, d-block cations, f-block cations, and combinations thereof, wherein M includes at least one element selected from an f-block element and a d-block element having at least one d-electron, except for vanadium, molybdenum, tungsten, niobium, or tantalum, wherein X includes at least one element selected from a p-block element, a d-block element, and an f-block element, except for oxygen, wherein k can range from 0 to 30, wherein m can range from 0 to 160, wherein n can range from 0 to 160, wherein o can range from 0 to 30, where p can range from 0 to 10, wherein q can range from 0 to 30, wherein r can range from 0 to 30, wherein s is a number so that y is greater than zero, wherein the sum of k, m, n, o, and p is greater than or equal to four; and wherein the sum of k, m, and q is greater than zero.
65. (New) The composition of claim 64, wherein the polyoxometalate has the formula $[X^aV_b^{I^*}M_c^{h^*}Z_{12-b-c}^{I^*}O_d]^u[A]$, wherein X is at least one p-, d-, or f-block element; g is greater than or equal to 2; M is at least one f-block element or d-block element having at least one d-electron, wherein M is not vanadium; h is from 1 to 7; i is from 5 to 6; j is from 4 to 5; x is 39 or 40; Z is tungsten, molybdenum, niobium, or a combination thereof; b is from 0 to 6; c is from 0 to 6; u is from 3 to 9; and A is a counterion.
66. (New) The composition of claim 65, wherein the polyoxometalate has the formula $[X^aV_b^{I^*}Z_{12-b}^{I^*}O_{40}]^u[A]$, wherein X is at least one of phosphorus, silicon, aluminum, boron, zinc, cobalt, or iron; b is from 1 to 6.
67. (New) The composition of claim 65, wherein the polyoxometalate has the formula $[X^aM_c^{h^*}Z_{12-c}^{I^*}O_{40}]^u[A]$, wherein X is at least one of phosphorus, silicon, aluminum, boron, zinc, cobalt, or iron; c is from 1 to 6, and a u is from 3 to 9.

68. (New) The composition of claim 64, wherein the polyoxometalate has the formula $[X_2^{r+}V_u^{s+}M_v^{t+}Z_{18-u-v}^{y+}O_z]^{w-}[A]$, wherein X is at least one p-, d-, or f-block element; r is greater than or equal to 1; M is at least one f-block element or d-block element having at least one d-electron, wherein M is not vanadium; t is from 1 to 7; s is from 4 to 5; Z is tungsten, molybdenum, niobium, or a combination thereof; a \bar{u} is from 0 to 9; v is from 0 to 9; y is from 5 to 6; z is 61 or 62; w is greater than or equal to 4; and A is a counterion.
69. (New) The composition of claim 68, wherein the polyoxometalate has the formula $[X_2^{r+}V_u^{s+}Z_{18-u}^{y+}O_{62}]^{w-}[A]$, wherein X is at least one of phosphorus, sulfur, silicon, aluminum, boron, zinc, cobalt, or iron; u is from 1 to 9; and w is greater than or equal to 4.
70. (New) The composition of claim 68, wherein the polyoxometalate has the formula $[X_2^{r+}M_v^{t+}Z_{18-v}^{y+}O_{62}]^{w-}[A]$, wherein X is at least one of phosphorus, sulfur, silicon, aluminum, boron, zinc, cobalt, or iron; v is from 1 to 9; and w is greater than or equal to 4.
71. (New) The composition of claim 64, wherein the polyoxometalate has the formula $[YV_pZ_{12-p}O_{40}][A]$, wherein Y is phosphorus, silicon, or aluminum; Z is tungsten or molybdenum; p is from 1 to 6, and A is a counterion.
72. (New) The composition of claim 64, wherein the metal nitrate is selected from iron (III) nitrate, cobalt (II) nitrate, nickel (II) nitrate, copper (II) nitrate, cerium (III) nitrate and cerium (IV) nitrate.
73. (New) The composition of claim 64, wherein the metal salt having weakly bound counter anions is selected from copper (II) perchlorate, copper (II) trifluoromethanesulfonate, and copper (II) tetrafluoroborate.

74. (New) The composition of claim 69, wherein the metal nitrate is selected from iron (III) nitrate, cobalt (II) nitrate, nickel (II) nitrate, copper (II) nitrate, cerium (III) nitrate and cerium (IV) nitrate, and wherein the metal salt having weakly bound counter anions is selected from copper (II) perchlorate, copper (II) trifluoromethanesulfonate, and copper (II) tetrafluoroborate.
75. (New) The composition of claim 69, wherein the polyoxometalate is selected from $\text{TBA}_6\text{Fe}_3\text{PW}_9\text{O}_{37}$, wherein TBA is tetra-*n*-butylammonium; $\text{TBA}_6\text{V}_{10}\text{O}_{28}$, $\text{TBA}_5\text{PV}_2\text{Mo}_{10}\text{O}_{40}$; $\text{TBA}_9\text{Fe}_3(\text{A-PW}_9\text{O}_{34})_2$; and $\text{TBA}_{12}\text{Fe}(\text{OH})_2\text{Fe}_2(\text{P}_2\text{W}_{15}\text{O}_{56})_2$.
76. (New) The composition of claim 59, wherein the metal nitrate is copper nitrate and the metal salt having weakly bound counter anions is copper trifluoromethanesulfonate.
77. (New) The composition of claim 59, wherein the composition is included in a material.
78. (New) The composition of claim 77, wherein the material being selected from a fabric, a topical carrier, powder, and a coating.
79. (New) The composition of claim 78, wherein the material being selected from a fabric, a topical carrier, powder, and a coating.
80. (New) A method of removing a contaminant, comprising:
contacting the composition of claim 59 with the contaminant.
81. (New) The method of claim 80, wherein the composition is included in a material
82. (New) The method of claim 81, wherein the material selected from a fabric, a topical carrier, powder, and a coating.
83. (New) The composition of claim 1, wherein the metal nitrate is iron (III) nitrate.
84. (New) The composition of claim 1, wherein the metal nitrate is cobalt (II) nitrate.

85. (New) The composition of claim 1, wherein the metal nitrate is nickel (II) nitrate.
86. (New) The composition of claim 1, wherein the metal nitrate is cerium (III) nitrate and cerium (IV) nitrate.